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Researchers describe novel antibody as potential active agent against Alzheimer's

Antibodies against Alzheimer's disease: researchers from Martin Luther University of Halle-Wittenberg (MLU), the Fraunhofer Institute for Cell Therapy and Immunology IZI and Halle-based company Probiodrug AG have succeeded in developing antibodies as potential active agents against the disease. At the same time, they have been able to describe the structure of a harmful form of the peptide associated with Alzheimer's in detail for the first time. The research units are presenting their findings in the globally renowned "Journal of Biological Chemistry".

Alzheimer's disease develops when certain harmful deposits are formed in the brain. "A specifically modified form of the amyloid beta peptide is especially dangerous here. Due to their structure, these peptides quickly clump together and become deposited in the brain," says Professor Milton T Stubbs from the Institute for Biochemistry and Biotechnology at the MLU. He headed up the new study together with the Fraunhofer IZI's Department of Drug Design and Target Validation in Halle (IZI MWT) and the company Probiodrug. The precursors to these deposits count among the most likely causes of the emergence of Alzheimer's disease.

All around the world, countless companies and research institutes are working on treatment options to combat Alzheimer's disease. Probiodrug recently hit the headlines when a low-molecular drug developed by the company delivered promising results in initial trials on Alzheimer's patients. The active agent inhibits the emergence of the modified peptide and its subsequent deposits in the brain.

The work carried out by the Halle-based research groups together with Probiodrug complements this approach: "Our new antibody-based drug is to take effect once the dangerous peptides have already been formed in the body. It acts like a vacuum cleaner, removing the substances from the system," says Dr Inge Lues, Chief Development Officer at Probiodrug and co-author of the publication. The antibodies could be injected into patients similar to a vaccination.

Editor

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In order for the respective antibodies to continue being developed here, detailed knowledge is required on how the harmful peptide can be recognized by the antibody. "If we are familiar with the structure of the peptide, we can develop the antibodies in such a way that they only attack this one specific substance," says Stubbs. His unit analyzed the structure of the antibody and looked at how it recognizes the Alzheimer's peptide.

Based on these results, new antibodies were able to be specifically developed and researched further. "Our investigations showed that the new active agent is well suited to specifically recognize the harmful peptide structures, which is expected to result in fewer side effects," says Professor Hans-Ulrich Demuth, Director of the Fraunhofer IZI MWT in Halle. Probiodrug AG is responsible for the preclinical and clinical development of this antibody.

Furthermore, the study showed that the modification within the peptide makes for a structure which – simply put – resembles the shape of a boxing glove. This distinctive structure might explain why these Alzheimer's-specific peptide compounds clump together so quickly.

Publication details:

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